

REMARKS

The Applicant hereby submits the present Amendment and Request for Reconsideration for the above-referenced patent application, entry of which is earnestly solicited. The presently application was originally filed with claims 1-30. In the present Amendment, claims 8, 16, 17 and 24 of the present application has been amended; no claims have been added or canceled. Thus, claims 1-30 as amended are pending in the present application after entry of the Amendment.

In the Office Action mailed on 6 January 2006, the Examiner objected to the title of the present application. In response, the Applicant changes the title to again recite the distinguishing structure as well as intended results produced by such structure.

In the same Office Action, the Examiner rejected claims 1-30 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-10, 22, 23 of U.S. Patent No. 6,680,828 (hereinafter the '828 patent). In response, the Applicant respectfully disagrees and submits that the claims are allowable for the following reasons.

In the rejection, the Examiner states that the claims “are not patentably distinct from [claims of the ‘828 patent] because the claimed invention is as shown in figure 5 [of the ‘828 patent] which utilizes AP structured pinned regions for sensors 402 and 404.” No other argument or articulation is provided by the Examiner.

The Applicant respectfully disagrees with the Examiner’s rejection. For one, the claims of the ‘828 patent appear to be limited to a structure which has no AFM pinning layer as they are directed to completely self-pinned structures (see e.g. claim 1 of the ‘828 patent: “a self-pinned magnetoresistive (MR) sensor”; see e.g. claim 22 of the ’828 patent: “wherein the second ferromagnetic layer has a first thickness that is different from a second thickness of the third ferromagnetic layer such that the second ferromagnetic layer and the third ferromagnetic layer are self-pinned”). Further, the ‘828 patent utilizes a central “APC layer” whereas the present invention utilizes a central “gap

layer". The '828 patent also appears not to utilize AP pinned layer structures but rather pure ferromagnetic (FM) layers. Finally, the free layers of the sensor in the '828 patent are provided at opposite ends of the sensor.

The Examiner has not identified any other prior art sources or references regarding any other these different and additional limitations. Further, the Examiner has not articulated with any detail whatsoever why any of these different and additional features are obvious in light of the '828 patent claims. The Applicant believes that the reason for this failure in articulation is due to the fact that these different and additional features result in an invention that is not obvious in light of the '828 patent claims.

Specifically, in contrast to the '828 patent and its claims, the present invention as defined by claims 1-30 as amended is directed to a sensor which has both an AP pinned layer structure and an AP self-pinned layer structure. The advantage of such sensor is that it is thinner than AP pinned structures and also overcomes difficulties in the polarity setting of AFM layers. See e.g. the present application at page 12 at lines 6-19:

Dual/differential spin valve sensors are advantageous as they yield signals of opposite polarity under common mode excitation, thereby resulting in rejection of common mode noise and providing a higher read resolution determined by the gap layer which separates the two spin valve structures. Conventionally, the two spin valve structures include an AP pinned layer structure having an associated AFM pinning layer. Unfortunately, however, the AFM setting process to establish 180° out-of-phase pinned structures becomes difficult. Specifically, after setting the polarity of the first AFM pinning layer for the first spin valve structure, setting the opposite polarity of the second AFM pinning layer for the second spin valve structure disturbs the polarity of the first AFM pinning layer. In accordance with the present invention, one of the spin valve structures of the sensor includes an AP pinned layer structure and the other spin valve structures includes an AP self-pinned layer structure. Advantageously, setting the polarity of the single AFM pinning layer utilized in this sensor is not difficult since only one AFM pinning layer needs to be set.

In addition, at least for some of the claims (e.g. see claims 8, 16, and 17-30), the invention is limited to free layer structures which are formed in close proximity to the central gap layer which separates the two spin valve structures.

For these reasons alone, the remaining claims are allowable over the prior art of record. Additional reasons for allowability for independent and dependent claims, as one ordinarily skilled in the art will readily appreciate, are not further articulated herein.

Based on the above, the Applicant submit that all pending claims 1-30 are allowable over the prior art of record and that the present application is now in a condition suitable for allowance.

Thank you. Please feel free to contact the undersigned if it would expedite the prosecution of the present application.

Respectfully submitted,



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Date: 28 Feb 2006

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